

The Use of Commercial Standards in DoD Applications



Next Generation Instrumentation Bus

**Sidney R. Jones, Jr.
Naval Air Warfare Center**

**Tom DeSelms
Eagan McAllister Associates, Inc**

<http://NexGenBus.Nawcad.Navy.Mil>

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Introduction



- High Speed Instrumentation Bus w/ rates 10-40x current systems is required
- No high speed commercial instrumentation buses available
- Must choose best available commercial standard

Choosing a Standard



- Know your application
- Search for the best overall fit
 - Cost, Schedule, and Performance
- Understand 'Standards Dynamics'
 - Companies participate to help the bottom line
 - Companies don't easily switch - even for better technical capability

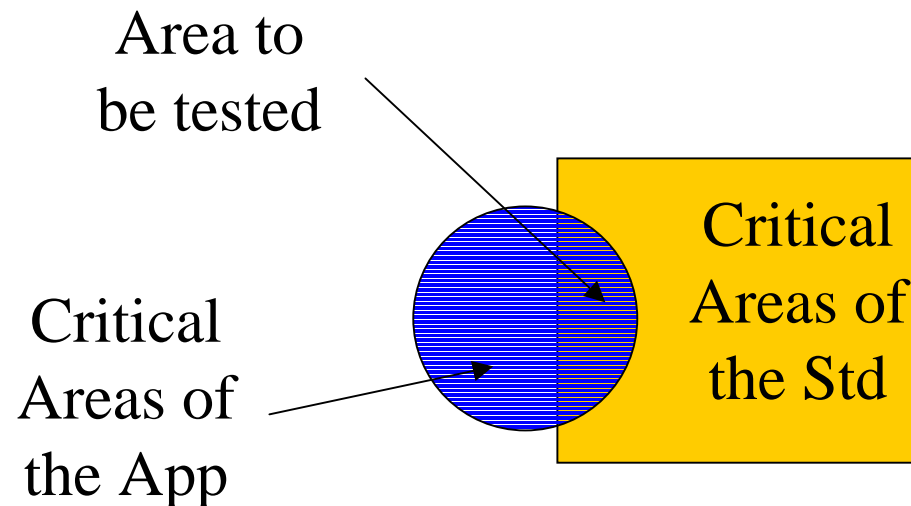
Choosing a Standard (cont)



- Use major tech criteria to rapidly narrow search to only potential solutions
- Add non-technical criteria
- Understand the maturity of the standard
- What is the activity level of the standard
- Where is the market going: prices/articles/etc.

Testing a Standard

- Define critical areas of both the application and standard
 - Not necessarily the same for both



Testing a Standard (cont)



- Testing Commercial Std. with COTS UUT
- What is being tested?
 - Ensuring correctness of standards document
 - How well the UUT adheres to the standard
- How to test?
 - COTS Units don't have many test points
 - With a failure, what subsystem failed?

Testing a Standard (cont)



- If standard doesn't work...
 - Relax requirement
 - Change the standard
 - Use different standard?

The NexGenBus Approach



- Research and Bus Selection
- 33 possible busses
 - | 100 Mbps min. (10 times greater than current sys)
- 8 potential busses
 - | Rate, BER, Copper/Fiber Optic, etc.
- 3 viable busses
 - | Fibre Channel, Firewire, Gigabit Ethernet
- Fibre Channel Selected for Testing

Testing



- Identify weaknesses in areas critical to instrumentation
- Using commercial standard and COTS end-items
 - | Lab Tests / Analysis / Simulation / 3rd party tests
- Special Test Equipment
 - | FC Protocol Analyzer, FC Traffic Generator, Communications Analyzer, ComNet III Network Simulator

Lab Testing



- Cable Analysis
 - What cables are available
 - Match their spec. against NGB requirements
- Best cables will be tested further in lab

Lab Testing (cont.)



- Connectors:
 - Useable in Test Articles
 - Field repair
 - EMI shielded

Simulation



- Creating initial model
 - Verifying FC against lab units
- Full model
 - Data acquisition network in Test Article
- Simulate effect of:
 - Protocols
 - Topologies, Redundancy
 - Timing

Summary



- Evaluate standards against applications
- Assess limitations of current standards
- Test critical areas between standards and applications
- Simulate areas too complex / expensive to test